

Cfe Higher Maths Homework (16)

- ① Find the equation of the median AD of triangle ABC where the coordinates of A, B and C are $(-2, 3)$, $(-3, -4)$ and $(5, 2)$ respectively. 3

- ② Find $\int (3x^3 + 4x) dx$. 3

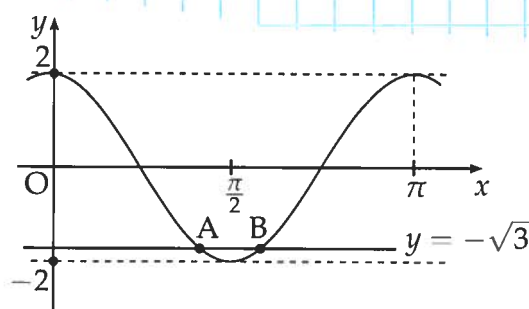
- ③ Find the equation of the perpendicular bisector of the line joining A $(2, -1)$ and B $(8, 3)$.

- ④ The diagram shows the graph of a cosine function from 0 to π .

(a) State the equation of the graph.

(b) The line with equation $y = -\sqrt{3}$ intersects this graph at point A and B.

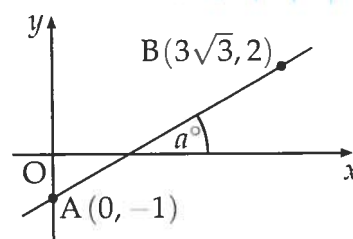
Find the coordinates of B.



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- ⑤ Find the size of the angle a° that the line joining the points A $(0, -1)$ and B $(3\sqrt{3}, 2)$ makes with the positive direction of the x -axis.



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- ⑥ Find $\int \frac{(x^2 - 2)(x^2 + 2)}{x^2} dx, x \neq 0$. 4

- ⑦ Solve the equation $\cos 2x^\circ + 5 \cos x^\circ - 2 = 0, 0 \leq x < 360$. 5

- ⑧ A function f is defined by the formula $f(x) = (x - 1)^2(x + 2)$ where $x \in \mathbb{R}$.

(a) Find the coordinates of the points where the curve with equation $y = f(x)$ crosses the x - and y -axes. 3

(b) Find the stationary points of this curve $y = f(x)$ and determine their nature. 7

(c) Sketch the curve $y = f(x)$. 2

[PTO]

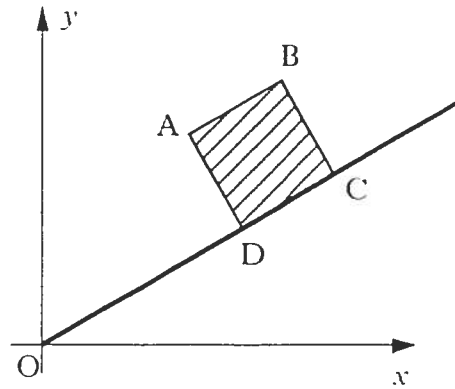
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Show that the equation $(1 - 2k)x^2 - 5kx - 2k = 0$ has real roots for all integer values of k .

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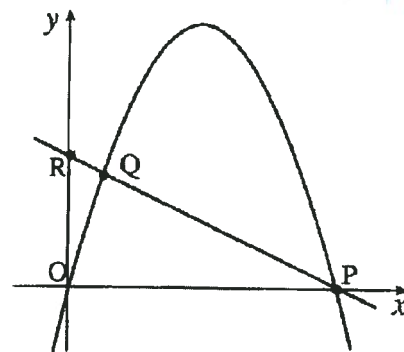
ABCD is a square. A is the point with coordinates (3, 4) and ODC has equation $y = \frac{1}{2}x$.



- (a) Find the equation of the line AD. (3)
- (b) Find the coordinates of D. (3)
- (c) Find the area of the square ABCD. (2)

11

The parabola shown in the diagram has equation $y = 4x - x^2$ and intersects the x -axis at the origin and P.



- (a) Find the coordinates of the point P. 2
- (b) R is the point (0, 2). Find the equation of PR. 2
- (c) The line and the parabola also intersect at Q. Find the coordinates of Q. 4